

sequelae. **References:** 1) Dhawan RT and al. Beyond the clot: perfusion imaging of the pulmonary vasculature after COVID-19. *Lancet Respir Med.* 2021;9(1):107–116. 2) Sitani K and al. Pulmonary Embolism as Post-COVID-19 Sequelae: Role of Lung Perfusion Scintigraphy. *Indian J Nucl Med.* 2021;36(4):455–456. 3) Sajal D and al. Lung Perfusion Scintigraphy Early After COVID-19: A Single-Center Retrospective Study. *J Nucl Med Technol.* 2021;49(4):320–323.

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Persistent dyspnea in post-COVID patients in the absence of pulmonary embolism: added value of lung perfusion scintigraphy

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Aim/Introduction: While there's a wide literature on Computed Tomography (CT) abnormalities in COVID-19 sequelae, the role of lung perfusion scintigraphy has been scarcely investigated. Recent findings reported lung microvascular and endothelial alterations in patients recovered from COVID-19 without pulmonary embolism (PE), presenting persistent dyspnea (post-COVID). We compared perfusion scintigraphy and CT findings of post-COVID patients with dyspneic subjects in whom lung scintigraphy excluded pulmonary embolism (non-COVID). The correlation between lung perfusion scintigraphy findings and 1) CT abnormalities and 2) clinical/biochemical parameters were also assessed. **Materials and Methods:** 18 post-COVID and 20 non-COVID patients who underwent lung perfusion scintigraphy and chest high-resolution CT for dyspnea from March 2020 to April 2022 were retrospectively enrolled. From lung perfusion scintigraphy images, counting rates for upper, middle, and lower fields were normalized for the total lung counts to calculate the corresponding ratios (UTR, MTR, and LTR, respectively). CT images were analyzed using a semi-automated segmentation algorithm of 3DSlicer (www.slicer.org), obtaining total, emphysematous, infiltrated and collapsed volumes, normalized for the total lung volumes. Similarly, blood vessel's volumes were collected to compute the vascular density. White blood cells (WBC) count, PT, INR, PTT and D-dimer of both groups, and the infection duration of post-COVID patients were collected from clinical records and blood tests performed before the lung perfusion scintigraphy. **Results:** At the per lung analysis, post-COVID patients with persistent dyspnea showed reduced LTR (24.67 ± 5.08) and higher MTR (52.51 ± 5.22) compared to non-COVID patients (29.85 ± 5.05 and 46.66 ± 3.94 , respectively; $p < 0.0001$ for both), while UTR resulted bilaterally superimposable between the two groups. At CT imaging, the rates of emphysematous, infiltrated and collapsed volumes and the vascular density were bilaterally similar in both groups. In post-COVID patients, LTR correlated with the percentage of emphysematous ($r = 0.498$; $p < 0.01$), infiltrated ($r = -0.464$; $p < 0.01$) and collapsed ($r = -0.463$; $p < 0.01$) lungs, while no significant correlations were observed between LTR and CT-derived volumes in non-COVID subjects. There was no correlation between lung perfusion scintigraphy parameters with infection duration in post-COVID, WBC, and coagulation biomarkers in

both groups. **Conclusion:** Lung perfusion scintigraphy can reveal reduced perfusion rates of lower pulmonary fields in post-COVID patients with persistent dyspnea without pulmonary embolism. This phenomenon is correlated with structural lung modifications, including lung parenchymal emphysema, infiltration and collapse, and is independent of infection duration and coagulation biomarkers. Although mechanisms underlying these findings need to be supported by pathological lung tissue examination, pulmonary non-thrombotic microvascular and endothelial dysfunction may be involved.

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FDG-PET Brain Imaging in the Evaluation and Follow-up of COVID-19

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Aim/Introduction: The novel coronavirus disease (COVID-19) is caused by the respiratory infection of SARS-CoV-2 virus and is characterized by a multisystemic inflammation, presenting with a wide spectrum of symptoms. ¹⁸F-fluoro-deoxy-glucose positron emission tomography/computed tomography (FDG-PET/CT) is a promising imaging method in the evaluation of acute-phase and late changes in the central nervous system. **Materials and Methods:** A single-centre, prospective clinical study (COMPOSIT study) was initiated where FDG-PET/CT was performed in adult COVID-19 patients during acute, infective state and 3 months later. Brain FDG-PET images were evaluated with a software utilizing a built-in, age-matched normal database and the degree of the differences (Z-scores) were investigated at the two imaging timepoints. **Results:** We present the data of 36 patients (14 women, 22 men), with a mean age of 52 years (42–75 years). In the acute, infective state, the majority of the patients presented with diffuse, significant cortical hypometabolism whereas at 3 months follow-up, the involved regions showed a marked and often complete metabolic normalization. The most common regions with residual hypometabolism at 3 months were the medial prefrontal and medial temporal regions and the anterior cingulate. Also, these regions showed the proportionally lowest rates of normalization. Hypometabolism was the least frequent in the cerebellum at the acute, infective state and its FDG-uptake showed a normalization in all but one case. **Conclusion:** Residual hypometabolism is common in the areas encompassing the orbitofrontal cortex and the limbic system while the cerebellar cortex was relatively spared. However, our study is limited by the corticosteroid-effect in the scans performed at the acute, infective state and furthermore, the fact that no metabolic data is available of the patients before SARS-CoV-2 infection. **References:** 1. Guedj E, Million M, Dudouet P et al. F-FDG brain PET hypometabolism in post-SARS-CoV-2 infection: substrate for persistent/delayed disorders? *Eur J Nucl Med Mol Imaging.* 2021;48(2):592–5. doi: 10.1007/s00259-020-04973-x. 2. Morbelli S, Ekmekcioglu O, Barthel H et al. COVID-19 and the brain: impact on nuclear medicine in neurology. *Eur J Nucl Med Mol Imaging.* 2020;47(11):2487–92. doi: 10.1007/s00259-020-04965-x. 3. Sollini M, Morbelli S, Ciccarelli M et al. Long COVID hallmarks on [18F]FDG-